

WHAT IS CLAIMED IS:

1. An image forming apparatus comprising:

a heating means for heating an image on a transfer  
5 material;

a power supply means for supplying electricity to  
the heating means;

an information detection means for detecting  
information on a thickness or surfaceness of the  
10 transfer material to be transported; and

an adjust means for adjusting an electricity  
supplied to the power supply means according to the  
information detected by the information detection  
means.

15

2. An image forming apparatus according to claim 1,  
wherein the adjust means comprises:

a first power control means for controlling the  
power supply means by a power ratio, a ratio of a  
20 desired power to a power obtained by fully turning on  
a half wave or full wave of an ac supply voltage, and  
for supplying power to the heating means for a  
predetermined duration at a predetermined first power  
ratio;

25 a current detection means for detecting a current  
being supplied to the heating means;

a calculation means for calculating a maximum

applicable power ratio to be supplied to the heating means, based on a difference between a current value detected by the current detection means and a maximum applicable current value that can be supplied to the heating means by the power control means; and

a second power control means for controlling the power to be supplied from the power supply means to the heating means at less than the maximum applicable power ratio calculated by the calculation means.

10

3. An image forming apparatus according to claim 2, wherein the current detection means comprises:

a current-voltage conversion means for converting an input current to the heating means into a voltage;

15 a half-wave rectifying means for half-wave rectifying the voltage produced by the current-voltage conversion means;

an integral means for integrating an half-wave rectified output produced by the half-wave rectifying means;

20

a differential amplifying means for amplifying a difference between an integrated result produced by the integral means and the half-wave rectified output;

a maximum value holding means for holding a maximum output from the differential amplifying means as a maximum value of the input current;

25

a first pulse signal output means for outputting a

pulse signal when an input supply voltage to the heating means falls below a predetermined threshold; and

a discharge means for discharging a capacitor

- 5 forming the integral means and a capacitor forming the maximum value holding means in response to the pulse signal from the first pulse signal output means.

4. An image forming apparatus according to claim 1,  
10 wherein the heating means is a fixedly positioned heater;

wherein the image forming apparatus comprises:

an image forming means for forming an unfixed toner image on a transfer material; and

- 15 a fusing means for permanently fixing the unfixed toner image on the transfer material, the fusing means having the fixedly positioned heater, a film adapted to move in contact with the heater, a pressure member cooperating with the heater, with the film interposed  
20 therebetween, to form a nip portion, and the adjust means, wherein the transfer material carrying the image is passed between the film and the pressure member in the nip portion to heat the image on the transfer material with heat radiated from the heater  
25 through the film;

wherein the adjust means comprises:

a temperature detection means for detecting a

temperature of the heater;

a current detection means for detecting a current flowing in the heater; and

a control means for controlling an electricity to  
5 the heater so that a current flowing in the heater is equal to a preset target current value and for correcting the preset target current value when the temperature detected by the temperature detection means as the transfer material passes through the nip  
10 portion deviates from a preset temperature range.

5. An image forming apparatus according to claim 4, wherein the film is a heating roller formed of an endless film, the pressure member is a pressing roller  
15 and the heater is in contact with an inner circumferential surface of the heating roller formed of the endless film.

6. An image forming apparatus according to claim 4,  
20 wherein the temperature detection means is arranged on a side of the heater opposite the side of the heater that is in contact with the film.

7. An image forming apparatus according to claim 4,  
25 wherein the image carried on the transfer material is an unfixed toner image and the unfixed toner image is permanently fixed through heating.

8. An image forming apparatus according to claim 4,  
wherein the current detection means comprises:

5 a current-voltage conversion means for converting  
an input current to the heating means into a voltage;

a half-wave rectifying means for half-wave  
rectifying the voltage produced by the current-voltage  
conversion means;

10 an integral means for integrating an half-wave  
rectified output produced by the half-wave rectifying  
means;

a differential amplifying means for amplifying a  
difference between an integrated result produced by  
the integral means and the half-wave rectified output;

15 a maximum value holding means for holding a maximum  
output from the differential amplifying means as a  
maximum value of the input current;

a first pulse signal output means for outputting a  
pulse signal when an input supply voltage to the  
20 heating means falls below a predetermined threshold;  
and

a discharge means for discharging a capacitor  
forming the integral means and a capacitor forming the  
maximum value holding means in response to the pulse  
25 signal from the first pulse signal output means.

9. An image forming apparatus according to claim 1,

wherein the heating means is a fixedly positioned heater;

wherein the image forming apparatus comprises:

an image forming means for forming an unfixed toner  
5 image on a transfer material; and

a fusing means for permanently fixing the unfixed  
toner image on the transfer material, the fusing means  
having the fixedly positioned heater, a film adapted  
to move in contact with the heater, a pressure member  
10 cooperating with the heater, with the film interposed  
therebetween, to form a nip portion, and the adjust  
means, wherein the transfer material carrying the  
image is passed between the film and the pressure  
member in the nip portion to heat the image on the  
15 transfer material with heat radiated from the heater  
through the film;

wherein the adjust means comprises:

a temperature detection means for detecting a  
temperature of the heater;

20 a current detection means for detecting a current  
flowing in the heater; and

a control means for controlling an electricity to  
the heater so that a temperature of the heater is  
equal to a preset target temperature and for  
25 correcting the preset target temperature when the  
current detected by the current detection means as the  
transfer material passes through the nip portion

deviates from a preset range.

10. An image forming apparatus according to claim  
9, wherein the film is a heating roller formed of an  
5 endless film, the pressure member is a pressing roller  
and the heater is in contact with an inner  
circumferential surface of the heating roller formed  
of the endless film.

10 11. An image forming apparatus according to claim  
9, wherein the temperature detection means is arranged  
on a side of the heater opposite the side of the  
heater that is in contact with the film.

15 12. An image forming apparatus according to claim  
9, wherein the image carried on the transfer material  
is an unfixed toner image and the unfixed toner image  
is permanently fixed through heating.

20 13. An image forming apparatus according to claim  
9, wherein the current detection means comprises:

a current-voltage conversion means for converting  
an input current to the heating means into a voltage;

a half-wave rectifying means for half-wave  
25 rectifying the voltage produced by the current-voltage  
conversion means;

an integral means for integrating an half-wave

rectified output produced by the half-wave rectifying means;

a differential amplifying means for amplifying a difference between an integrated result produced by the integral means and the half-wave rectified output;

a maximum value holding means for holding a maximum output from the differential amplifying means as a maximum value of the input current;

a first pulse signal output means for outputting a pulse signal when an input supply voltage to the heating means falls below a predetermined threshold; and

a discharge means for discharging a capacitor forming the integral means and a capacitor forming the maximum value holding means in response to the pulse signal from the first pulse signal output means.

14. An electrophotographic image forming apparatus having a heating means and a power supply means for supplying electricity to the heating means, the electrophotographic image forming apparatus comprising:

a first power control means for controlling the power supply means by a power ratio, a ratio of a desired power to a power obtained by fully turning on a half wave or full wave of an ac supply voltage, and for supplying power to the heating means for a



predetermined duration at a predetermined first power ratio;

a current detection means for detecting a current being supplied to the heating means by the first power control means;

a calculation means for calculating a maximum applicable power ratio to be supplied to the heating means, based on a difference between a current value detected by the current detection means and a maximum applicable current value that can be supplied to the heating means by the power control means; and

a second power control means for controlling the power to be supplied from the power supply means to the heating means at less than the maximum applicable power ratio calculated by the calculation means.

15. An image fusing device having a fixedly positioned heater, a film adapted to move in contact with the heater, and a pressure member cooperating with the heater, with the film interposed therebetween, to form a nip portion, wherein a transfer material carrying an image is passed between the film and the pressure member in the nip portion to heat the image on the transfer material with heat radiated from the heater through the film, the image fusing device comprising:

a temperature detection means for detecting a

temperature of the heater;

a current detection means for detecting a current flowing in the heater; and

a control means for controlling an electricity to  
5 the heater so that a current flowing in the heater is  
equal to a preset target current value and for  
correcting the preset target current value when the  
temperature detected by the temperature detection  
means as the transfer material passes through the nip  
10 portion deviates from a preset temperature range.

16. An image fusing device according to claim 15,  
wherein the film is a heating roller formed of an  
endless film, the pressure member is a pressing roller  
15 and the heater is in contact with an inner  
circumferential surface of the heating roller formed  
of the endless film.

17. An image fusing device according to claim 15,  
20 wherein the temperature detection means is arranged on  
a side of the heater opposite the side of the heater  
that is in contact with the film.

18. An image fusing device according to claim 15,  
25 wherein the image carried on the transfer material is  
an unfixed toner image and the unfixed toner image is  
permanently fixed through heating.

19. An image forming apparatus comprising:  
an image forming means for forming an unfixed toner  
image on a transfer material; and  
5 a fusing means for permanently fixing the unfixed  
toner image carried on the transfer material;  
wherein the fusing means is the fusing device of  
claim 15.

10 20. An image fusing device having a fixedly  
positioned heater, a film adapted to move in contact  
with the heater, and a pressure member cooperating  
with the heater, with the film interposed therebetween,  
to form a nip portion, wherein a transfer material  
15 carrying an image is passed between the film and the  
pressure member in the nip portion to heat the image  
on the transfer material with heat radiated from the  
heater through the film, the image fusing device  
comprising:

20 a temperature detection means for detecting a  
temperature of the heater;  
a current detection means for detecting a current  
flowing in the heater; and  
a control means for controlling an electricity to  
25 the heater so that a temperature of the heater is  
equal to a preset target temperature and for  
correcting the preset target temperature when the

current detected by the current detection means as the transfer material passes through the nip portion deviates from a preset range.

5        21. An image fusing device according to claim 20, wherein the film is a heating roller formed of an endless film, the pressure member is a pressing roller and the heater is in contact with an inner circumferential surface of the heating roller formed  
10 of the endless film.

22. An image fusing device according to claim 20, wherein the temperature detection means is arranged on a side of the heater opposite the side of the heater  
15 that is in contact with the film.

23. An image fusing device according to claim 20, wherein the image carried on the transfer material is an unfixed toner image and the unfixed toner image is  
20 permanently fixed through heating.

24. An image forming apparatus comprising:  
an image forming means for forming an unfixed toner image on a transfer material; and  
25 a fusing means for permanently fixing the unfixed toner image carried on the transfer material;  
wherein the fusing means is the fusing device of

claim 20.

25. An image forming apparatus having a fusing device, comprising:

5 a current-voltage conversion means for converting an input current to the fusing device into a voltage;

a half-wave rectifying means for half-wave rectifying the voltage produced by the current-voltage conversion means;

10 an integral means for integrating an half-wave rectified output produced by the half-wave rectifying means;

a differential amplifying means for amplifying a difference between an integrated result produced by the integral means and the half-wave rectified output;

15 a maximum value holding means for holding a maximum output from the differential amplifying means as a maximum value of the input current;

a first pulse signal output means for outputting a pulse signal when an input supply voltage to the fusing device falls below a predetermined threshold; and

20 a discharge means for discharging a capacitor forming the integral means and a capacitor forming the maximum value holding means in response to the pulse signal from the first pulse signal output means.